



LEOPOLD CENTER  
FOR SUSTAINABLE AGRICULTURE

# Evaluating on-farm food handling practices and microbiological quality of locally grown produce and eggs

Abstract: Food safety practices used on the farm by Iowa fruit and vegetable and fresh shell egg producers were examined. Recommendations for improvements were suggested at a workshop at the end of the project and several extension bulletins were published.

## Question & Answer

**Q:** Why do fruit and vegetable growers and fresh shell egg producers need to worry about food safety?

**A:** Produce growers and egg producers should be aware of potential contaminants on the foods they produce, some of which occur on the farm due to cross contamination, unsafe water, or inappropriate production and handling practices. This project provided producers with information about how to establish a food safety system for their operations to minimize risks from contamination.

## Background

Food safety can be related to on-farm practices in production and food handling. Iowa food producers can use more of this information as the number of operations doing direct sales (to consumers, restaurants, and institutions) and farmers markets increase and the public becomes more aware of the dangers of cross-contamination of food. Food safety and Good Agricultural Practices (GAPs) will become increasingly critical matters for conscientious food producers.

Project objectives were to:

1. Increase fruit and vegetable growers' and fresh shell egg producers' awareness and understanding of harvest, post-harvest, and delivery practices consistent with GAPs and methods of assessment in qualitative research;

2. Increase fruit and vegetable farmers' and fresh shell egg producers' knowledge of food safety issues when supplying restaurants and institutional foodservice establishments; and
3. Identify areas for improvement in production practices of fresh produce and shell eggs to minimize risks of foodborne illness.

## Approach and methods

The project used a qualitative approach and focused on food producers who marketed fresh produce or fresh shell eggs. After a review of pertinent literature and other farm safety reports, the investigators developed an on-farm food safety assessment tool. There were open-ended questions about the farm and items being produced. The bulk of the assessment form collected six categories of information about specific performance standards. Among the categories were: general information, the farm, field harvest and picking, packaging/processing facility, transportation from farm to market, and pick-your-own.

Next were structured interviews with each producer, including questions about their interests and concerns, current practices related to on-farm safety, and their perceptions of buyer's concerns. The investigators also made plans for an option to have food samples collected and analyzed for levels of specific pathogens such as *Salmonella* spp in fresh shell eggs) and *Listeria monocytogenes*, *Escherichia coli*, and *Salmonella* spp (in

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fresh produce). All samples were analyzed for coliform counts.

Eleven on-farm sites were visited by the project coordinator, who assessed current operating practices and interviewed the producers. If desired, food samples were collected and analyzed according to a pre-established protocol. When the site visits were completed, a producer workshop was held in November 2003 and strategies for future education were identified.

### **Results and discussion**

**General information:** Nine operations produced fresh produce and two produced fresh shell eggs. Most operations were in central Iowa with a few in northeast Iowa. All 11 farms had a potable water source. Improvements were needed in hand-washing protocols and staff training at three-fourths of the sites.

**The farm:** All 11 farms had good water quality and proper use practices. Half the farms needed to test and document water quality more carefully. Those operations with on-site manure handling and application were adhering to best management practices.

**Field harvest and picking:** Good agricultural practices were observed at all farms for field cleaning procedures while 91 percent of the farms were seen demonstrating appropriate hygiene practices and 73 handled product appropriately. Recommendations in this area dealt with staff training, hand washing, restriction of pets and wildlife from food fields, and care and handling of equipment.

**Packaging/processing facility:** Good agricultural practices were seen at all farms for packaging, at 91 percent of farms for hygiene, at 73 percent of farms for facilities, and for 70 percent of the ten farms with cold storage. Changes encouraged at this stage of the process dealt with hand washing, improvements of break facilities, equipment cleaning, sanitation, product washing and sanitation, and use of proper clothing.

**Transportation from farm to market:** Good hygiene and attention to product handling to minimize damage were practices observed at all farms. The need for cleanliness (55 percent) and temperature control (27 percent) were seen at this phase of production.

**Pick-your-own:** Only four of the 11 farms offered the option to pick-your-own produce. Of these, 75 percent had good practices with regard to policies for pets. Suggestions were made that two operations consider improvements to visitor facilities and containers used by visitors for harvesting.

### **Conclusions**

General conclusions were that:

- Many of the farmers were adhering to good agricultural practices.
- The need remains to implement additional practices that will help ensure the safety of the product at all phases of the operation.
- Off-season planning and documentation can be improved.
- Development of a farm safety plan should prove useful.

Producers at the workshop were very interested in learning about effective cleaning and sanitizing agents and procedures for use on food products and contact surfaces. Fresh produce items rarely receive heat treatment, so it is important that any pathogenic bacteria be kept to minimal levels. Transmission of viruses from food handlers is another area of concern.

### **Impact of results**

Little research has been reported on food handling practices of producers and the micro-biological quality of locally grown produce. This pilot project offered a methodology for evaluating the operations of local producers and some limited results were provided based on a limited sample. More work needs to be done to evaluate food handling by local producers as well as to identify appropriate channels to distribute information about food safety as it relates to their operations. A multidisciplinary approach to food handling practices suitable for local producers needs to be developed, perhaps in concert with academic investigators and ISU Extension practitioners.

### **Education and outreach**

Presentations were done in January 2004 at the Iowa Fruit and Vegetable Growers Association annual meeting

and the Practical Farmers of Iowa conference. Project results, workshop presentations, and other information about local foods have been posted on the ISU Extension Hotel, Restaurant and Institution Management program web site at: <http://www.extension.iastate.edu/hrim/localfoods/>.

Three extension publications about on-farm food safety practices, food handling, and cleaning and sanitizing were developed and are available in electronic and print form on the ISU Extension publications web site: [www.extension.iastate.edu/publications/pm1947a.pdf](http://www.extension.iastate.edu/publications/pm1947a.pdf) , [www.extension.iastate.edu/publications/pm1947b.pdf](http://www.extension.iastate.edu/publications/pm1947b.pdf), and [www.extension.iastate.edu/publications/pm1947c.pdf](http://www.extension.iastate.edu/publications/pm1947c.pdf).

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